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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,654	11/13/2001	Elizabeth Jane Acosta	YAMAP0793US	6310

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EXAMINER	
NGO, HUYEN LE	

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 11/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/031,654	ACOSTA ET AL.	
	Examiner	Art Unit	
	Julie-Huyen L. Ngo	2871	AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *30 May 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-5,7-14,16-23 and 25-37* is/are pending in the application.

4a) Of the above claim(s) *3,8-13,21-23,25-31,36 and 37* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,5,7,14,16-20 and 32-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Election/Restrictions

Applicant's election **without** traverse of species I (figure 11), which reads on claims 1, 4, 5, 7, 14,16-20 and 32-35, in the response filed on May 30, 2003 is acknowledged.

Claims 3, 8-13, 21-23, 25-31, 36 and 37 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4, 16 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bonnett et al. (EP869470A1 or US6104368A) in view of Tillin et al. (GB231878A or US6204904B1) provided in Applicants' IDS.

With respect to claims 1 and 16, Bonnett et al. disclose (col. 8, line 5 to col. 9, line 45, and Figs. 11-13) a reflective liquid crystal device (LCD) comprising in sequence a retarder arrangement comprising two retarders, and a reflector, characterized in that:

- a first of said retarders provides a retardation of substantially $m\lambda/2$ and
- a second of the retarders provides a retardation of substantially $n\lambda/4$ where m=1 is an integer and n=1 is an odd integer,
- at least one of the said first and second retarders comprises a Bistable Twisted Nematic (BTN) liquid crystal, and the at least one of the said first and second retarders is switchable between a first state in which the retarder provides a retardation of substantially $m\lambda/2$ or $n\lambda/4$ and a second state in which the retardation is substantially zero.

However, Bonnett et al. fails to disclose a linear polariser on the retarders.

It is well known in the art to have a linear polariser on retarders for linearly polarizing unpolarized light incidence on the linear polariser, and to either transmit or absorb the light reflects from the retarders for displaying a preferred image as evidenced by Tillin et al. with the linear polariser 1 adjacent to the retarders 3-5 and the reflector 2 (see description of figures 1-7).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a reflective liquid crystal device as disclosed by Bonnett et al. with a linear polariser on the retarders for linearly polarizing unpolarized light incidents on it and to either transmit or absorb the light reflects from the retarders for displaying a preferred image, as taught by Tillin et al.

With respect to claim 4,

- the BTN liquid crystal in Bonnett et al. reflective LCD is switchable between a first state in which it substantially converts linearly polarized light to circularly polarized light and a second state in which it does not convert linearly polarized light to circularly polarized light

With respect to claims 17-19,

- the wavelength λ in Bonnett et al. reflective LCD is an operating wavelength of the reflective liquid crystal device and is in the range of visible spectrum centered about 520nm which is within the ranges of 400-700nm.

With respect to claim 20,

- the retarder in Bonnett et al. reflective LCD comprising a BTN liquid crystal provides a retardation of $n\lambda/4$.

Therefore, Bonnett et al. reflective LCD in view of Tillin et al. would obviously comprise all the limitations recited in claims 1, 4,16 and 17-20.

Claims 1, 5, 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tillin et al. (GB231878A or US6204904B1) in view of Bonnett et al. (EP869470A1 or US6104368A) provided in applicants' IDS.

With respect to claim 1, Tillin et al. teach (col. 10, lines 1-9 and Fig. 7) a reflective liquid crystal device (LCD) comprising in sequence

- a linear polariser 1

- a retarder arrangement comprising two retarders 3-5 and a reflector 2 characterized in that, in at least one state of the device, a first of said retarders acts to rotate linearly polarized light of wavelength λ, and
- a second of the retarders acts to convert linearly polarized light of wavelength $y\lambda$ (where y=1 and 0.7<y<1.3) to substantially circular polarized light

However, Tillin et al. fail to disclose at least one of the said first and second retarders comprises a Bistable Twisted Nematic (BTN) liquid crystal.

Bonnett et al. teach forming a reflective LCD having at least one of the two retarders comprised a Bistable Twisted Nematic (BTN) liquid crystal for fast switching and addressing waveforms.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a reflective liquid crystal device as disclosed by Tillin et al. with at least one of the said first and second retarders comprising a Bistable Twisted Nematic (BTN) liquid crystal for fast switching and addressing waveforms.

Tillin et al. reflective LCD as modified by Bonnett et al above would obviously comprise all the features recited in the following claims since Tillin et al. reflective LCD disclose that:

(Claim 5)

- the retarder adjacent to the linear polarizer 1 is a fixed retarder 3 with an optic axis at an angle θ_1, to either the transmission or absorption axis of the polariser,

and the retarder 4 adjacent to the reflector 2 is a BTN which in the low twist state, θ, has the input director (LC director at cell surface adjacent to retarder) at an angle $\theta_2 = 2\theta_1 + \theta(\Phi) + x$, wherein $x<5^o$

(Claim 7)

- θ_1 is substantially 15° and the low twist state is substantially $\Phi = 0°$ (as shown in Figure 16)

(Claim 14)

- the retarder adjacent to the polariser is a BTN which in the low twist state has $\Phi = 0°$ and optic axis at an angle α to either the transmission or absorption axis of the polariser and retarder adjacent to the reflector is a fixed retarder with optic axis at an angle $2\alpha+45°+x$, wherein $x < 5°$, preferably 0°

Therefore, Tillin et al. reflective LCD in view of Bonnett et al. would obviously comprise all the limitations recited in claims 1, 5, 7 and 14.

Claims 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bonnett et al. in view of Tillin et al. as applied to claims 1 and 16 above, and further in view of Takahashi et al. (US6061042A).

Takahashi et al. teach (col. 5 lines 8-26) a BTN that switches between a state Φ and $\Phi\pm180°$ (claims 33 &35), and between a state Φ and $\Phi\pm360°$ (claims 32 &34) for achieving a multilevel gray scale in the liquid crystal display device.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the reflective LCD of Bonnett in view

of Tillin et al. with at least one of the said first and second retarders comprising a Bistable Twisted Nematic (BTN) liquid crystal switching between a state Φ and $\Phi \pm 180°$ (claims 33 &35), and between a state Φ and $\Phi \pm 360°$ (claims 32 &34) for achieving a multilevel gray scale in the reflective LCD, as taught by Takahashi et al.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Dozov et al. (US 20030128314 A) disclose Bistable device for reflection display with inverse contrast.

Lee (US 6469768 B1) discloses a bistable twisted-nematic mode reflective liquid crystal display.

Contact Information

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Julie-Huyen L. Ngo whose telephone number is (703) 305-3508. The Examiner can normally be reached on T-Friday.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Mr. Robert H. Kim can be reached at (703) 305-3492.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Papers related to this application may be submitted by facsimile transmission at the centralized facsimile number (703) 872-9306.

October 15, 2003

Julie Huyen L. Ngo
Patent Examiner
Art Unit 2871